

Late Blight in Saskatchewan

Late blight (*Phytophthora infestans*) is a fungal disease that attacks members of the Solanaceae family – tomatoes, potatoes, peppers, eggplant. Blight damage to the leaves and stems reduces vigor and yield potential. Blight damage to potato tubers and the fruit of tomatoes, peppers and eggplant causes rot in the field or during storage. In the 19th century, late blight devastated potato crops across Europe, leading to mass starvation and emigration. Today late blight occurs worldwide and it is still the single most damaging disease of potato crops. However, in Saskatchewan late blight has not been a common problem. The hot dry summers typical of SK are not conducive to the development and spread of late blight. However the cool rainy conditions encountered across SK in 2010 were near ideal for blight, and losses were substantial.

The objective of this article is to provide gardeners with information for identifying and managing late blight in 2011.

Lifecycle

Late blight overwinters on diseased potato tubers. If diseased tubers are inadvertently used as seed, late blight will likely be present on the emerging plants. Initially the fungus grows vegetatively within the plant, but if weather conditions are conducive it will soon begin to produce spores which will spread the disease onto adjacent plants and into nearby fields. **Disease development, spore formation and infection of adjacent plants by late blight are all favored by moderate temperatures (15-20°C) and frequent showers or heavy dews (relative humidity in excess of 90%).** Under suitable conditions disease development can be very rapid, with entire fields destroyed within days. Fruit forming on infected tomato, pepper and eggplant will exhibit rapidly growing dry, reddish brown lesions, often on the “shoulder” of tomatoes. The infected fruit will rot on the plants or during storage. Potato tubers are infected by spores that wash from blight-infected leaves into the soil. Infected tubers may appear normal from the outside but when cut the flesh near the outside of the tuber shows a characteristic reddish brown rot.

Disease Management

Tools available for management of late blight include planting healthy seed, forecasting suitable weather conditions for infection, scouting the crop, cultural techniques, genetic resistance, and protective spraying.

Forecasting and Monitoring

As late blight has the potential to cause devastating damage Saskatchewan Agriculture and the Department of Plant Sciences at the University of Saskatchewan are working with commercial growers and hobby gardeners to monitor growing conditions and the incidence and spread of late blight within SK in 2011.

Scouting is important to late blight management. Catching an outbreak in its earliest stages can reduce losses and increase options for control. Growers should scout their

crops frequently, especially if conditions have been suitable for the development of blight or blight has been reported in the area. Examine the leaves and stems throughout the canopy. The first sign of blight on leaves is a water-soaked area usually at the margin of the leaves. The lesions run across the veins, as opposed to early blight where the lesions are typically confined by the leaf veins. In dry weather, late blight lesions stop growing and turn dark brown and brittle. In wet weather the lesions grow quickly, with the older, darker areas of the lesion surrounded by a halo of pale yellowish, newly infected tissue. Early in the morning or on wet days a white cottony growth may be detected on the undersides of infected leaves. Infected stems and petioles will turn dark brown or black. As the infected stems weaken they droop, giving a characteristic flagging look to the canopy.

Suspect plants should be immediately pulled out, bagged, removed from the field and destroyed. The plants in the vicinity of the infected plant are also likely infected – ideally they will also be removed or at least closely monitored for signs of disease development.

As late blight requires very high humidity to spread it usually shows up in the wettest areas of the field and in places protected from wind. These areas should be scouted frequently.

Potato tubers and tomato fruit going into storage should be carefully inspected, with any suspect items removed and destroyed. Monitor the stored crop carefully, especially for the first few weeks after harvest, as late blight has the potential to spread within storages.

Cultural Control

Clean seed is the first line of defense against late blight. **Avoid planting seed potatoes that may potentially be carrying blight, as this is how blight carries over from season to season.** Purchase seed potatoes from reputable suppliers with a proven history of effective disease management. Inspect the seed prior to purchase or planting and discard any suspect tubers. Culled potatoes should be bagged, buried, composted, or otherwise disposed of – if they sprout and grow they will spread disease. **Late blight cannot survive on tomato seed but it can be introduced on transplants.**

Cultivar resistance - While no potato varieties are fully resistant to late blight, russet varieties tend to be more blight resistant than red types. Some tomato cultivars claim to be tolerant of blight;

Grape tomatoes – cv. Santa and Juliet

Standard tomatoes – cv. Defiant and Legend

NB - these cultivars have not been tested for their suitability in SK.

Production practices - Excessive viney growth of tomatoes and potatoes caused by over-application of N fertilizers invites late blight infection. Time watering so the foliage dries before evening. If possible, water the soil around the plants and not the foliage. Tomatoes should be pruned and staked to promote airflow through the canopy.

Proper hilling of the potato crop will help protect the tubers from being infected by blight spores washing from infected leaves into the soil. Potato vines should be completely dead and ideally removed from the garden prior to harvest, otherwise spores can spread from vines to the tubers during the harvest operation. If possible, leave tubers in the ground for about two weeks after the vines have been destroyed. This allows blighted tubers to rot so they can be easily identified and culled out at harvest. Tubers set near the soil surface are most likely to be infected, therefore it is prudent to discard any tubers that show any signs of greening. If more than 5% of the harvested tubers have late blight it is unlikely that the crop can be successfully stored.

Following harvest, potatoes should be held for 2 weeks at 15°C with abundant airflow and then slowly cooled to 5°C. Once the crop has been cooled to 5°C the potential for further development of blight in storage is limited. Tomatoes, peppers and eggplants must be stored at warmer temperatures and under these conditions blight development and spread is rapid. No methods of washing or disinfecting will prevent late blight from developing on potato tubers or tomato/pepper fruit once they have been infected.

Sprays

Protecting the foliage with commercially available copper-based fungicidal sprays such as Bordeaux Mix can be effective if the sprays are applied repeatedly and carefully over the full duration of the growing season. **Spraying must commence before the blight arrives, with new spray applications after rain events and/or as new foliage develops.** Complete coverage of both surfaces of the leaf and the stems is crucial when spraying for late blight. While copper-based sprays are generally considered to be safe to the applicator and the crop there are concerns about their impact on beneficial soil organisms such as earthworms. Growers are encouraged to take an integrated approach to managing blight rather than relying strictly on spraying to control the problem.

Vigilance will be the key to managing late blight in 2011 – keep a close eye on your own crop and listen for reports of the disease occurring in your area. If you suspect late blight in your crop contact Gardenline (306 966-5865), Doug Waterer at the University of Saskatchewan (306 966-5860) or Connie Achtymichuk with Saskatchewan Agriculture at (306 787-2755) immediately.



Late Blight on potato leaves and tomato fruit